Attachment B – Summary of Operational Changes

SIMSS Release 3.0 capabilities are listed below. New capabilities are shown in bold.

General

- Implement a client-server architecture
- Run the client user interface on either a separate or same system as the server
- Provide a user-friendly, graphical user interface
- Allow the user to stop, start, pause, and reconfigure the system
- Allow the user to monitor the status of the system and to view the data being manipulated by the system
- Allow the user to save and restore the current system configuration
- Provide the capability to receive and transmit data using standard Internet protocols (IP).
- Provide the capability to receive and transmit data using standard serial interface standards.
- Provide the capability to log data
- Provide the capability to send data from a file
- Provide the capability to generate a CCSDS AOS telemetry stream
- Provide the capability to encode or decode a serial stream
- Provide a generic capability to add headers and trailers to data
- Provide a generic capability to remove and validate headers and trailers from data
- Provide a scripting capability
- Provide the capability to take in and validate non-CCSDS commands
- Provide the capability to generate TDM telemetry
- Provide the capability to validate a CCSDS AOS telemetry stream
- Allow the user to configure the system to perform whatever capabilities are currently desired out of the above capabilities
- **Implement save/restore for all modules with configurable data**
- **Implement version identification for all modules**
- **Implement pause/resume for modules that need these capabilities**
- **Implement directory browsing capability for modules needing file selection**
- **Enlarge standard buffer display**
- **Enhance SIMSS library to include I64 numerical container data type**
- **Directive line history/edit capability**

IP input and output

- Receive data in standard IP protocols, specifically TCP/IP (client or server), UDP/IP unicast, and UDP/IP multicast
- Transmit data in standard IP protocols, specifically TCP/IP (client or server), UDP/IP unicast, and UDP/IP multicast
- Allow the user to define the IP address, port number, and data size (or a variable data size) for receiving or sending
- Allow the user to see the data being received or transmitted

- Display the status of input and output, including enabled/disabled status and packet counts

Serial input and output
- Receive data in standard serial configuration
- Transmit data in standard serial configuration
- Allow the user to set the serial configuration parameters
- Allow the user to see the data being received or transmitted
- Display the status of input and output, including enabled/disabled status and packet counts
- Encode and decode the serial stream
- **Provide telemetry data request ticks through 9001 message type to the data source module**

Logging
- Save incoming data to a file
- Allow the user to enable or disable logging and enter the name and maximum size of the log file
- Allow the user to see the data being logged
- Display the status of logging, including enabled/disabled status and the number of bytes written to the file

File transmission
- Send data from a file
- Allow the user to enable or disable file transmission and enter the name of the file to transmit
- Allow the user to set the file transmission mode and configuration, including block size, number of blocks, automatic or manual transmission, and interval between block transmits
- Allow the user to see the data being transmitted

CCSDS telemetry generation
- Generate telemetry according to CCSDS AOS standards for packets and VCDUs
- Generate telemetry based on the contents of a formatted text file (as defined in the user's guide). The text file includes packet definitions (including size, data rate, and virtual channel) and virtual channel to physical channel mapping
- Generate up to three physical channels of telemetry
- Update counters in packet headers
- Pack packets into VCDUs with packets crossing VCDU boundaries as needed
- Allow the user to display and change the contents of telemetry packets
- Handshake with the serial module to send telemetry using serial interface
- **Allow telemetry to pick up CLCW through packet message**

Test module
- Provide the capability to monitor data output from other modules from within the same SIMSS configuration

Scripting

- Provide the capability to send a stream of externally-generated directives to a module

Data transport

- Implement a generic, file-driven capability to package a stream of data into standard or user-defined message blocks with headers and trailers
- Implement a generic, file-driven capability to extract data from standard or user-defined message blocks, validating and removing headers and trailers
- Provide a standard command echo capability
- **Allow relaying the telemetry generation ticks between data source and sink to support Serial I/O**

TDM command ingest

- Provide a capability to read in and validate non-CCSDS commands
- Update a command counter based upon valid commands received
- Generate an event message for each command received
- **Allow command counter location to be settable by user**
- **Allow GUI configuration for preamble/postamble (length), barker code, and sc address**

TDM telemetry generation

- Provide the capability to generate a user-customizable stream of major-frame/minor-frame telemetry
- Allow the user to define counters in the telemetry stream
- Allow the user to define fixed fields in the telemetry stream
- Provide the option of including a CRC field in each minor frame

CCSDS data quality monitoring

- Provide the capability of receiving and validating a CCSDS AOS telemetry stream by extracting packets from VCDUs
- Allow the user to view the packets received
- Verify that the counters in the packet headers are updating correctly and no packets were missed

Data monitoring

- Provide the capability of monitoring and manipulating data received
- Allow the user to convert the data between NRZ-L and NRZ-M
- Allow the user to invert the data
- Allow the user to view the data in octal, decimal, or hexadecimal
- Allow the user to bit-shift the data left or right

Scenario

- **Allow command received to trigger scenario**
- **Allow scenario to start scenario**

- **Allow multiple scenarios (up to five, controlled via GUI)**
- **Allow pause indefinitely capability**
- **Allow scenario generation to be either serial or concurrent mode**

Interface to Model Generator

- **Allow SIMSS to receive (name, value) pair data generated from Model Generator**

CCSDS command ingest

- **Provide the capability to receive, validate, and identify CCSDS commands**
- **Allow the generation of CLCW for each virtual channel to reflect the commands received**
- **Provide the capability to receive and execute CCSDS FARM special commands**

CCSDS command generation

- **Provide the capability to create, save, read, modify, and transmit CCSDS telecommand headers and binary files**
- **Allow the generation of CCSDS composite files**
- **Allow the processing of raw data file containing CCSDS-formatted command data**